Series 8000 Super Card
Installation Guide

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Unit 15, Riverside Business Centre, Victoria Street, High Wycombe, Bucks HP11 2LT
Web: www.casecomms.com Email: sales@casecomms.com
Tel (UK): 08700 263 740 Tel (International): +44 (0) 1494 833 740
Fax (UK): 08700 263 741 Fax (International): +44 (0) 1494 833 741

STATUTORY NOTICES

APPROVED for connection to telecommunication systems specified in the instructions for use subject to the conditions set out in them.

NS/1282/1/L/601989
NS/1282/1/L/601988

UK PSS AND KILOSTREAM

For connection to UK PSS and KiloStream services, see Appendix D.

LITHIUM BATTERY

The lithium used in the battery of this unit will react violently with water and most gases. Discharged batteries must not be crushed, incinerated or disposed of in the normal waste. Used batteries should be collected and disposed of in an approved land fill. The manufacturer and your local waste authority will provide more detailed information about their disposal.

Accidental charging and short circuiting of the battery may cause overheating and possible rupture.

Replace only with the same or equivalent type recommended by the equipment supplier.

BATTERIE LITHIUM

Attention: Il y a danger d'explosion s'il y a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un type recommandé par le constructeur. Mettre au rébut les batteries usagées conformément aux instructions du fabricant.

EMC WARNING

The Electro-Magnetic Compatibility (EMC) performance of this product is maintained through the use of screened cables as specified in Appendix C.

The use of alternative cables may compromise this performance, for which the user will be required to correct at his own expense.

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Preface

This guide provides information for network controllers to install Series 8000 Super Cards in the 8210 and 8310 Basic Units and the 8325 Compact PSE.

These cards will normally be installed by Case engineers. This guide is provided to users for background information, and to assist their Case-trained engineers to install additional cards.

It is assumed that the person installing the Super Card is familiar with the installation and configuration of the 8210, 8310 and 8325 units.

MORE STATUTORY NOTICES

Case Communications Ltd declare that this product conforms with the protection requirements of Council Directive 89/336/EEC on the approximation of the laws of the member states relating to electromagnetic protection.

All PCB assemblies contain Electrostatic Sensitive Devices (ESDs) which may be permanently damaged if incorrectly handled. This equipment must be handled in accordance with BS5783 code of practice for the handling of electrostatic sensitive devices

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1 The Series 8000 Super Card

1.1 Introduction

The Series 8000 Super Card is a multi-purpose processor that plugs into the Cray 8210 and 8310 Basic Units or the 8325 Compact PSE.

The card is fitted with 8295 multi-protocol software.

1.2 Physical Description

The Super Card, part number X870-603411, is illustrated in Figure 1-1.

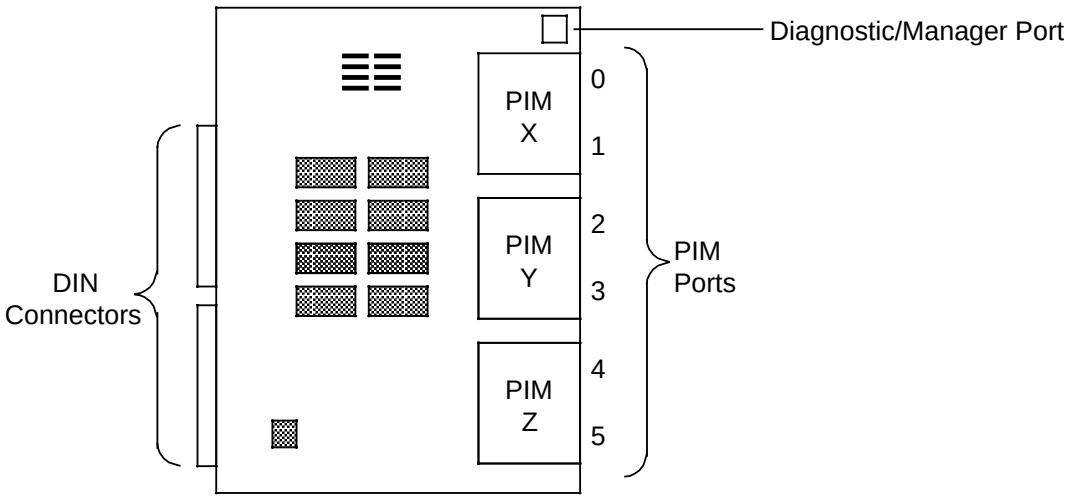

Figure 1-1 Super Card

The front of the card has two 96-way DIN connectors that fit into the motherboard in the 8210/8310/8325 chassis. (Unused card positions on the 8210/8310/8325 are fitted with blanking plates, part number X870-900003.)

The rear of the card has provision for mounting three Physical Interface Modules (PIMs), each of which carries two port connectors and associated interface circuitry. (Unused PIM positions are fitted with blanking covers part number X890-904503.) Any combination of currently available PIMs may be utilised. These connectors are accessible from the back of the 8310/8325 unit and provide connections to computers, terminals, etc.

Figure 1-2 shows a Super Card rear panel with three PIMs. The PIM positions are X, Y and Z, and port numbers 0-5, from right to left.

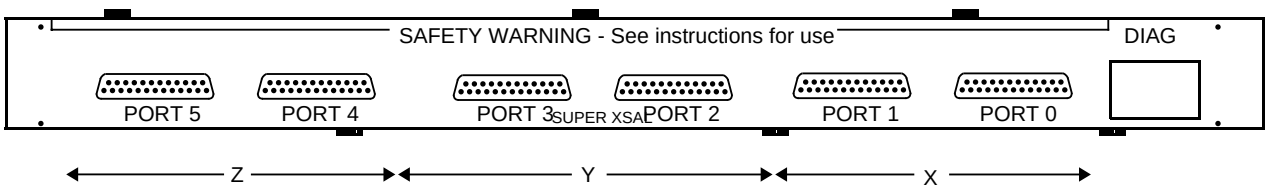

Figure 1-2 Super Card Rear Panel

There is an 8-pin diagnostic/manager port at the right of the card.

Real-time status information is presented on the 8310/8325 unit's LCD display panel or 8210 LED displays.

1.3 PIMs

As described in Section 1.2, each Super Card can carry up to three PIMs, each of which provides the interface circuitry and physical connectors for two ports.

A list of available PIM types is given in Table 1-1.

PIM TYPE	INTERFACE	CONNECTOR TYPE
PIM 1	V.24 DTE	2 x 25-way D-type male
PIM 2	X.21/V.36 DTE	2 x 15-way D-type male
PIM 3	V.35 DTE	2 x 15-way D-type male
PIM 4	X.21/V.36 DCE	2 x 15-way D-type female
PIM 5	V.24 DCE	2 x 25-way D-type female
PIM 6	X.21 DTE/DCE	1 x 15-way D-type male 1 x 15-way D-type female
PIM 7	X.21 DTE/V.24 DTE	1 x 15-way D-type male 1 x 25-way D-type female

Table 1-1 PIM Types

Instructions for installing PIMs onto a Super Card are given in Chapter 2.

2 Installation

This equipment may only be installed by engineers who are qualified to do so.

2.1 Installing the Super Card

The rear of the 8210/8310/8325 unit may contain up to four blanking plates. To install a card:

1. It is not necessary to remove power to install a card (they are designed to be 'live' inserted).
2. Undo the two screws securing a blanking plate to the chassis and remove. (Store the plate for future use.)
3. Gently slide in the card, the 96-way connectors facing in, by aligning the edges with the two plastic guides in the unit. When the card is almost fully in the unit, give a firm push with your thumbs, so that the connectors plug firmly into the motherboard in the unit.
4. Secure the card to the chassis using the two fixing screws.

Note that each slot must be occupied by either a card or a blanking plate: see Statutory Notice in the Basic Unit Installation Guides.

2.1.1 Use of Screened Cables

The use of the specified screened cables is mandatory if Electro-Magnetic Compatibility (EMC) performance is not to be compromised. Refer to Statutory Notices.

Not all Cray specified cables that connect to conventional D-type connectors on this product are screened. Where screened cables are specified, it is the users responsibility to ensure that any connecting cable is suitably screened to maintain the EMC performance.

2.1.2 Pin 1 (Frame Ground) to Signal Ground

Where D-type connectors are provided on the rear panel(s) for V.24 and X.21 interfaces, Pin 1 (Frame Ground) is connected to Signal ground through the use of a shorting link (0R resistor). However Pin 1 is not normally connected in Cray specified cables. If you are using alternative cables you should seek expert advice, to avoid problems caused by earth-loops created through connections to Pin 1.

Where it is not possible to isolate this connection at any other point in the system, you may remove the relevant resistors. Identify the appropriate port(s) and determine what type of interface card is fitted:

PIM-1, X890-605611, V.24 DTE, 25-way D-types	R1 & R3
PIM-2, X890-605711, X.21 DTE, 15-way D-types	R1 & R3
PIM-3, X890-605811, V.35 DTE, 25-way D-types	No Facility
PIM-4, X890-605911, X.21 DCE, 15-way D-types	R1 & R3
PIM-5, X890-607311, V.24 DTE, 25-way D-types	R1 & R3
PIM-6, X890-607211, X.21 DTE/DCE, 15-way D-types	R4 & R6
PIM-7, X890-607111, V.24 DTE/X.21 DTE, 25/15-way D-types	R2 & R7

2.2 Installing the PIMs on the Super Card

Each Super Card carries up to three PIMs which offer a choice of physical interface in groups of two ports. The following procedures should be followed to initially install or change the required PIMs. They assume that the Super Card is viewed with the circuitry uppermost and its rear panel metalwork nearmost.

Caution: Ensure that the Super Card and PIM are suitably protected from static discharge during these procedures. The earthing point on the rear of the 8210/8310/8325 chassis may be used to attach suitable wrist straps etc.

To install a PIM:

1. a) Remove the jacking posts from the 25-way D-type connectors, or

   b) Remove the four fixing screws from the metalwork around the 15-way D-type connectors.

2. a) Remove the existing PIM blanking cover, or

   b) Gently but firmly lever the existing PIM up so that the plastic pillars disengage from the PIM PCB, allowing the PIM to be removed from the socket strips on the Super Card.

3. Carefully locate the PIM, solder-side up, with its interface connectors positioned through the holes in the Super Card metalwork.

4. Engage the header strips of the PIMs with the socket strips on the Super Card.

5. Check that all pins are correctly located, and gently but firmly press the PIM down so that the plastic pillars locate in the smaller holes of the PIM PCB.

6. Secure the PIM to the Super Card rear metalwork using either the jacking posts or fixing screws removed at stage 1.

To remove a PIM:

1. Carry out operation 1 above.

2. Carry out operation 2 b) above.

3. Replace the PIM with a PIM blanking cover (part number X890-904503), secured with four fixing screws.

2.3 Indicators

When the 8210/8310/8325 unit is powered up, a number of indications are displayed on the front display.

For the 8310/8325:

The green LED below the **Enter** button indicates that power is on.

The status of each card is given on the LCD display. Each slot is numbered between 1 and 5 and has three indicators:

- **f** Fault
- ***** Ready 2
- **r** Ready 1

If the letter **S** appears before the **f**, ***** and **r** indicators, it indicates that the card installed is a Super Card.

For the Super Card:

The indicators have the following meaning:

Sf	ON:	Power-up tests in progress
	FLASHING:	Hardware failure
	OFF:	Normal
S*	OFF:	Normal
	FLASHING:	Diagnostic test failure
	ON:	Diagnostic test failure
Sr	ON:	Link A (port 0) 'up'
	FLASHING:	Link A (port 0) 'down'
	OFF:	No power to the card

The power-up tests are described in Section 2.6. To interpret diagnostic failures refer to Table 2-1.

For the 8210:

The green LED (leftmost on the bottom row) indicates that power is on.

The status of each card is reflected by the two rows of LEDs (the bottom row of LEDs reflects the status of the bottom card and likewise the top row for the top card):

Red	Fault
Yellow	Ready 2
Green	Ready 1

2.4 Other Equipment

Check interfaces between the Super Card and all other equipment which is to be connected (modems, computers, terminals) to ensure compatibility of data and control lines. Any changes necessary must be made in the interconnecting cables.

If the Super Card is being installed in an 8325, it is necessary to have at least one interconnection between the Super Card and an X.25 SAC port somewhere in the 8325. If there is one such connection it should be to the Super Card's composite port (port 0).

The type of cable to be used depends on the type of PIM; however, use of V.24 for this purpose is not recommended as it limits the data rate to 19.2 kbps.

2.5 Public Digital Services

For connection to UK public digital services network termination units (NTUs), please refer to Appendix D, which gives the required statutory and technical information on permissible interfaces, pin-outs and cabling.

For information concerning any statutory requirements for connections to public digital services in countries other than the UK please contact your distributor or Cray Communications Customer Services.

2.6 Power-Up Diagnostics

The power-up diagnostics provide a quick self-test facility for the Super Card. They are executed following a hardware reset. The power-up diagnostics test, briefly, all of the major hardware components to give confidence that the card is working correctly.

The tests are run in the order that they are described below, and if all is well control is passed to the application software. If any tests fail however, the LCDs will display an error code for around 20 seconds whereupon the card will restart and retest. Table 2-1 gives the error code meanings.

LED/LCD DISPLAY			MEANING
RED f	YELLOW *	GREEN r	
On	On	On	CPU not running
On	Off	Off	Testing in progress
Flash	Off	Flash	EPROM checksum failure
Flash	Off	Off	BRAM failure
Flash	Fast Flash	Flash	SCC failure
Flash	Off	On	DRAM failure
Flash	Fast Flash	On	PTM failure
Flash	On	Flash	IUSC failure
Flash	Flash	Fast Flash	XILINX failure
Flash	Flash	On	Application CSUM failure
Fast Flash	Fast Flash	Fast Flash	Exception fault
Off	Off	On/Flash	Software OK

Table 2-1 Power-Up Error Codes

Display Test

All three characters **f**, ***** and **r** (Red, Yellow and Green LEDs, on 8210)are turned ON and OFF alternately in a walking pattern for around 5 seconds. At the end of the test only the **f** (Red LED) character will remain ON, indicating further testing is in progress.

EPROM Checksum Test

To ensure that the correct EPROMs are fitted, and also that they have been programmed correctly, an auto-sizing, Add and XOR checksum test is performed.

Action/Possible faults

Check that the correct EPROMs are fitted, and are in the correct positions and orientation.

Check for bent pins on all IC legs on the EPROMs.

Application PROM Test

To ensure that the correct application EPROMs are fitted, an ADD and XOR checksum test is performed. In addition a blank or missing device is also checked for.

Action/Possible faults

Check that the Application EPROMs are actually fitted.

Check that they are the correct EPROMS, in the correct locations, and in the correct orientation.

Check that there are no bent pins.

DRAM Test

A simple read/write access test to every location in the DRAM is performed. The data 55AA is written to each location, read back and compared. This is then repeated with the data inverted. This process is repeated for every location. After each location has been tested, its address is written and a check is performed to ensure that each location is unique.

Action/Possible faults

Faulty DRAM or associated circuitry.

BRAM Test

A simple, non-destructive read/write test of every location in the BRAM is performed. A test pattern of 55AA is written to each location and then

read back and compared. This process is repeated with the data inverted. This is then repeated for each location.

Action/Possible faults

Check that the BRAM shorting link is in the correct position.

Faulty BRAM circuitry.

IUSCC Test

This test checks that each IUSCC may be accessed, and that read and write cycles operate correctly.

Action/Possible faults

Faulty IUSCC or associated circuitry.

PTM Test

A simple read/write access test. The device is initialised and then the data 55AAAA55 is written to the counter register. It is read back and compared before the process is repeated with the data inverted.

Action/Possible faults

Faulty PTM or associated circuitry.

SCC Test

A simple read/write access test. The data 55 is written to the counter low byte register. It is read back and compared before being inverted and the process repeated.

Action/Possible faults

Faulty SCC or associated circuitry.

Exception Fault

It is possible that faulty hardware may generate invalid exceptions and terminate proceedings with an exception error display.

Action/Possible faults

Check that all socketed devices are in the correct location and orientation, and that there are no bent pins.

3 Logging On

You can control the Super Card either from a local terminal, or over the X.25 network.

3.1 Locally

A VT100 compatible terminal is required, which is referred to as the 'manager terminal'. It must have the following attributes:

speed:	1200, 2400, 4800, 9600 or 19k2 bps
data bits:	8
parity:	none
stop bits:	1

1. Connect the manager terminal to the Super Card diagnostic/manager port with cable X870-401511 (see Appendix C for details).
2. Enter **<CR>**. A prompt message will be displayed. Type **99L** and enter **<CR>**. A screen will be displayed.
3. At the password prompt, enter **<PF1>**. The 8295 top level menu will be displayed.

3.2 From X.25

The 'manager' of a Super Card may be accessed remotely from an X.25 triple-X PAD. If the X.3 parameters of the remote PAD are configurable then the following values are recommended:

Parameter 2: 0 (echo off)
Parameter 3: 2 (packet forwarding on CR)
Parameter 4: 4 (packet forwarding on timeout)

1. Make a call using an X.121 address that matches the remote manager address. The default subaddress is 99.
2. A welcome screen will be displayed and prompt for a password. Enter the correct password followed by **<PF1>**. The top-level menu will be displayed.
3. If the password is incorrectly entered three times, or it takes longer than a minute to enter it, then the call will be automatically cleared.

Refer to the relevant user guide for configuration information.

Appendix A Specification Summary

Power Supply	Obtained from 8210/8310/8325 unit
Power Consumption	10 watts

Environment

Ambient Temperature	Operating: +5°C to +40°C Storage: –25°C to +55°C
Relative Humidity	5% to 95% non-condensing
Altitude	Up to 3000m

Appendix B Interface Specifications

PIM1 **Synchronous V24/RS-232-D DTE**

Part Number	X890-605611
Interfaces	2 × 25-way D-type plug (male) DTE
Controls In	CTS, RI, DCD, DSR
Controls Out	DRS, BO, RTS, DTR
Clocks	RxC, TxC, XTxC
Clocking Speeds	Up to 19200 baud

Pin	Signal	Description
1	FG	Frame Ground
2	TxD	Transmit Data
3	RxD	Receive Data
4	RTS	Request To Send
5	CTS	Clear To Send
6	DSR	Data Set Ready
7	GND	Signal Ground
9	DCD	Data Carrier Detect
15	TxC	Transmitter Clock
17	RxC	Receiver Clock
20	DTR	Data Terminal Ready
22	RI	Ring Indicator
23	DRS	Data Rate Select
24	XTxC	Transmitter Clock, DTE source
25	BO	Busy Out

PIM2	**Synchronous X.21 DTE**
Part Number	X890-605711
Interfaces	2 × 15-way D-type plug (male) DTE
Controls In	Indication
Controls Out	Control
Clock	Signal Element Timing 'S'
Clock Source	External
Clocking Speeds	Up to 256000 baud

PIM2	**Synchronous V.36 DTE**
Part Number	X890-605711
Interfaces	2 × 15-way D-type plug (male) DTE
Controls In	DCD
Controls Out	RTS, DTR*
Clocks	RxC, TxC
Clocking Speeds	Up to 256000 baud

Pin	**X.21 Signal**	**Description**	**V.36 Equivalent Signals***
1	FG	Frame Ground	–
2	T(A)	Transmit Data+	TxD(A)
3	C(A)	Control+	RTS(A), DTR(A)
4	R(A)	Receive Data+	RxD(A)
5	I(A)	Indication+	DCD(A)
6	S(A)	Clock+	RxC(A), TxC(A)
8	G	Signal Ground	SGND
9	T(B)	Transmit Data –	TxD(B)
10	C(B)	Control –	RTS(B), DTR(B)
11	R(B)	Receive Data –	RxD(B)
12	I(B)	Indication –	DCD(B)
13	S(B)	Clock –	RxC(B), TxC(B)

* using V.36 DCE cable of Figure C-7.

PIM3 **Synchronous V.35 DTE**

Part Number	X890-605811
Interfaces	2 × 15-way D-type plug (male) DTE
Controls In	CTS, DCD
Controls Out	RTS
Clocks	RxC, TxC, XTxC
Clocking Speeds	Up to 256000 baud

Pin	Signal	Description
1	DCD	Data Carrier Detect
2	TxD(A)	Transmit Data+
3	RTS	Request To Send
4	RxD(A)	Receive Data+
5	RxC(A)	Receive Clock+
6	TxC(A)	Trasmit Clock+
7	XTxC(A)	Transmit Clock+ (DTE source)
8	GND	Signal Ground
9	TxD(B)	Transmit Data –
11	RxD(B)	Receive Data –
12	RxC(B)	Receive Clock –
13	TxC(B)	Transmit Clock –
14	XTxC(B)	Transmit Clock – (DTE source)
15	CTS	Clear To Send

PIM4	**Synchronous X.21 DCE**
Part Number	X890-605911
Interfaces	2 × 15-way D-type plug (female) DCE
Controls In	Control
Controls Out	Indication
Clock	Signal Element Timing 'S'
Clock Source	Internal
Clocking Speeds	2400, 4800, 7200, 9600, 19200, 48000, 64000, 128000 and 256000 baud

PIM4	**Synchronous V.36 DCE**
Part Number	X890-605911
Interfaces	2 × 15-way D-type plug (female) DCE
Controls In	RTS
Controls Out	DCD
Clocks	RxC, TxC
Clocking Speeds	2400, 4800, 7200, 9600, 19200, 48000, 64000, 128000 and 256000 baud

Pin	**Signal**	**Description**	**V.36 Equivalent Signals***
1	FG	Frame Ground	–
2	T(A)	Transmit Data+	TxD(A)
3	C(A)	Control+	RTS(A)
4	R(A)	Receive Data+	RxD(A)
5	I(A)	Indication+	DCD(A)
6	S(A)	Clock+	RxC(A), TxC(A)
8	G	Signal Ground	SGND
9	T(B)	Transmit Data –	TxD(B)
10	C(B)	Control –	RTS(B)
11	R(B)	Receive Data –	RxD(B)
12	I(B)	Indication –	DCD(B)
13	S(B)	Clock –	RxC(B), TxC(B)

* using V.36 DTE cable of Figure C-8.

PIM5 Synchronous V.24/RS-232-D DCE

Part Number	X890-607311
Interfaces	2 × 25-way D-type plug (female) DCE
Controls Out	CTS, RI, DCD, DSR
Controls In	DRS, BO, RTS, DTR
Clocks	RxC, TxC, XTxC
Clocking Speeds	Up to 19200 baud

Pin	Signal	Description
1	FG	Frame Ground
2	TxD	Transmit Data
3	RxD	Receive Data
4	RTS	Request To Send
5	CTS	Clear To Send
6	DSR	Data Set Ready
7	GND	Signal Ground
9	DCD	Data Carrier Detect
15	TxC	Transmitter Clock
17	RxC	Receiver Clock
20	DTR	Data Terminal Ready
22	RI	Ring Indicator
23	DRS	Data Rate Select
24	XTxC	Transmitter Clock, DTE source
25	BO	Busy Out

PIM6 port a	**Synchronous X.21 DTE**
Part Number	X890-607211
Interface	15-way D-type plug (male) DTE
Controls In	Indication
Controls Out	Control
Clock	Signal Element Timing 'S'
Clock Source	External
Clocking Speeds	Up to 256000 baud

Pin	**X.21 Signal**	**Description**
1	FG	Frame Ground
2	T(A)	Transmit Data+
3	C(A)	Control+
4	R(A)	Receive Data+
5	I(A)	Indication+
6	S(A)	Clock+
8	G	Signal Ground
9	T(B)	Transmit Data –
10	C(B)	Control –
11	R(B)	Receive Data –
12	I(B)	Indication –
13	S(B)	Clock –

PIM6 port b	**Synchronous X.21 DCE**
Part Number	X890-607211
Interface	15-way D-type plug (female) DCE
Controls In	Control
Controls Out	Indication
Clock	Signal Element Timing 'S'
Clock Source	Internal
Clocking Speeds	2400, 4800, 7200, 9600, 19200, 48000, 64000, 128000 and 256000 baud

Pin	**Signal**	**Description**
1	FG	Frame Ground
2	T(A)	Transmit Data+
3	C(A)	Control+
4	R(A)	Receive Data+
5	I(A)	Indication+
6	S(A)	Clock+
8	G	Signal Ground
9	T(B)	Transmit Data –
10	C(B)	Control –
11	R(B)	Receive Data –
12	I(B)	Indication –
13	S(B)	Clock –

PIM7 port a	**Synchronous X.21 DTE**
Part Number	X890-607111
Interface	15-way D-type plug (male) DTE
Controls In	Indication
Controls Out	Control
Clock	Signal Element Timing 'S'
Clock Source	External, Internal
Clocking Speeds	Internal: 2400, 4800, 7200, 9600, 19200, 48000, 64000, 128000 and 256000 External: up to 256000

Pin	X.21 Signal	Description
1	FG	Frame Ground
2	T(A)	Transmit Data+
3	C(A)	Control+
4	R(A)	Receive Data+
5	I(A)	Indication+
7	CLK(A)	Clock Out+
6	S(A)	Clock+
8	G	Signal Ground
9	T(B)	Transmit Data –
10	C(B)	Control –
11	R(B)	Receive Data –
12	I(B)	Indication –
13	S(B)	Clock –
14	CLK(B)	ClockOut –

PIM7 port b **Synchronous V.24/RS-232-D DTE**

Part Number	X890-607111
Interface	25-way D-type plug (male) DTE
Controls In	CTS, RI, DCD, DSR
Controls Out	DRS, BO, RTS, DTR
Clocks	RxC, TxC, XTxC
Clocking Speeds	Up to 19200 baud

Pin	Signal	Description
1	FG	Frame Ground
2	TxD	Transmit Data
3	RxD	Receive Data
4	RTS	Request To Send
5	CTS	Clear To Send
6	DSR	Data Set Ready
7	GND	Signal Ground
9	DCD	Data Carrier Detect
15	TxC	Transmitter Clock
17	RxC	Receiver Clock
20	DTR	Data Terminal Ready
22	RI	Ring Indicator
23	DRS	Data Rate Select
24	XTxC	Transmitter Clock, DTE source
25	BO	Busy Out

Appendix C Cables

This appendix gives the part number and pinout for all available standard cables.

PIM TYPE	PIM INTERFACE TYPE	REMOTE INTERFACE TYPE	LENGTH	PART NUMBER	PINOUT DIAGRAM
PIM1/7	DTE	DCE	3M	X890-403111	C-1
PIM1/7	DTE	DCE	5M	X890-408611	C-1
PIM1/7	DTE	DTE	3M	X890-403011	C-2
PIM1/7	DTE	DTE	5M	X890-408711	C-2

Refer to the Series 8000 Xpress PSE User Guide for V.54 cable applications.

Table C-1 V.24 Cables

PIM TYPE	PIM INTERFACE TYPE	REMOTE INTERFACE TYPE	LENGTH	PART NUMBER	PINOUT DIAGRAM
PIM2/6/7	DTE	DCE	3M	X890-401011	C-4
PIM2/6/7	DTE	DCE	5M	X890-408811	C-4
PIM2/6/7	DCE	DTE	3M	X890-401011	C-4
PIM2/6/7	DCE	DTE	5M	X890-408811	C-4

Note that X.21 DTE and DCE cables are identical. To change a port from a DCE connection to a DTE connection, replace the PIM2 with a PIM4, or use an alternative port on PIM6.

Table C-2 X.21 Cables

PIM TYPE	PIM INTERFACE TYPE	REMOTE INTERFACE TYPE	LENGTH	PART NUMBER	PINOUT DIAGRAM
PIM3	DTE	DCE	3M	X890-403411	C-5
PIM3	DTE	DCE	5M	X890-409411	C-5
PIM3	DTE	DTE	3M	X890-403311	C-6
PIM3	DTE	DTE	5M	X890-409511	C-6

Table C-3 V.35 Cables

PIM TYPE	PIM INTERFACE TYPE	REMOTE INTERFACE TYPE	LENGTH	PART NUMBER	PINOUT DIAGRAM
PIM2/6/7	DTE	DCE	3M	X890-406611	C-7
PIM2/6/7	DTE	DCE	5M	X890-409011	C-7
PIM2/6/7	DCE	DTE	3M	X890-406711	C-8
PIM2/6/7	DCE	DTE	5M	X890-409111	C-8

Table C-4 V.36 Cables

PIM TYPE	PIM INTERFACE TYPE	REMOTE INTERFACE TYPE	LENGTH	PART NUMBER	PINOUT DIAGRAM
PIM1/7	V.24 DTE	V.24 NTU	5M	X818-401211	D-1
PIM2/6/7	X.21 DTE	X.21 NTU	5M	X890-408411	D-2
PIM3	V.35 DTE	V.35 NTU	5M	X818-401311	D-3

Refer to Appendix D for cable pinout diagrams.

Table C-5 UK PSS/KiloStream NTU Cables

INTERFACE TYPE	REMOTE INTERFACE TYPE	LENGTH	PART NUMBER	PINOUT DIAGRAM
8-way DIN	DTE	0.7M	X870-401511	C-9

Table C-6 Diagnostic/Manager Port

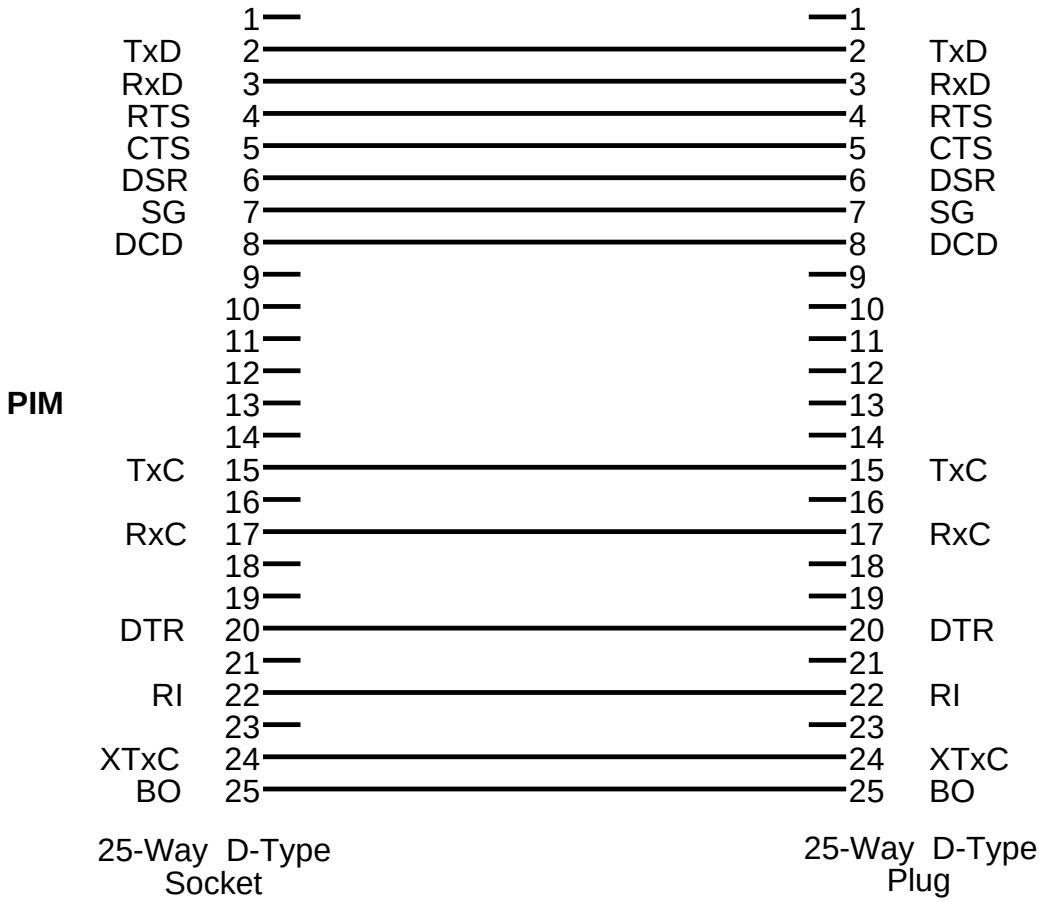

Figure C-1 V.24 DCE Cables X890-403111 and X890-408611

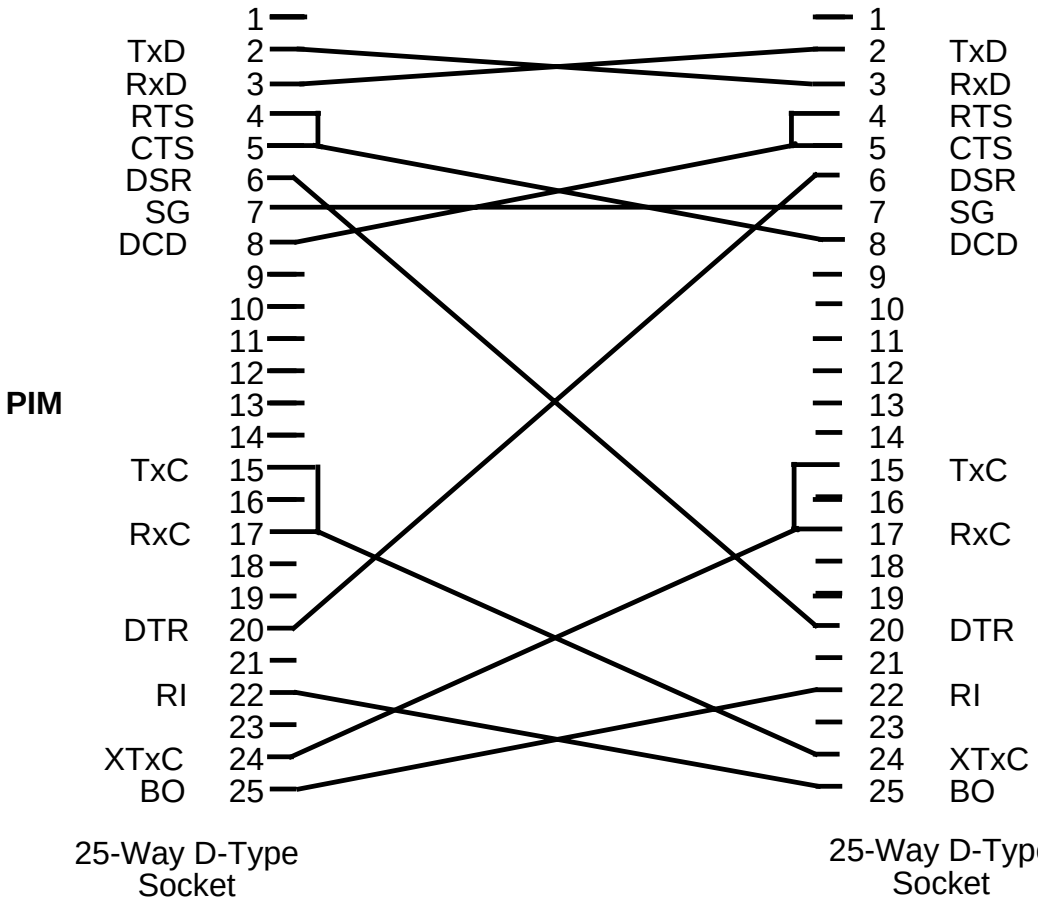

Figure C-2 V.24 DTE Cables X890-403011 and X890-408711

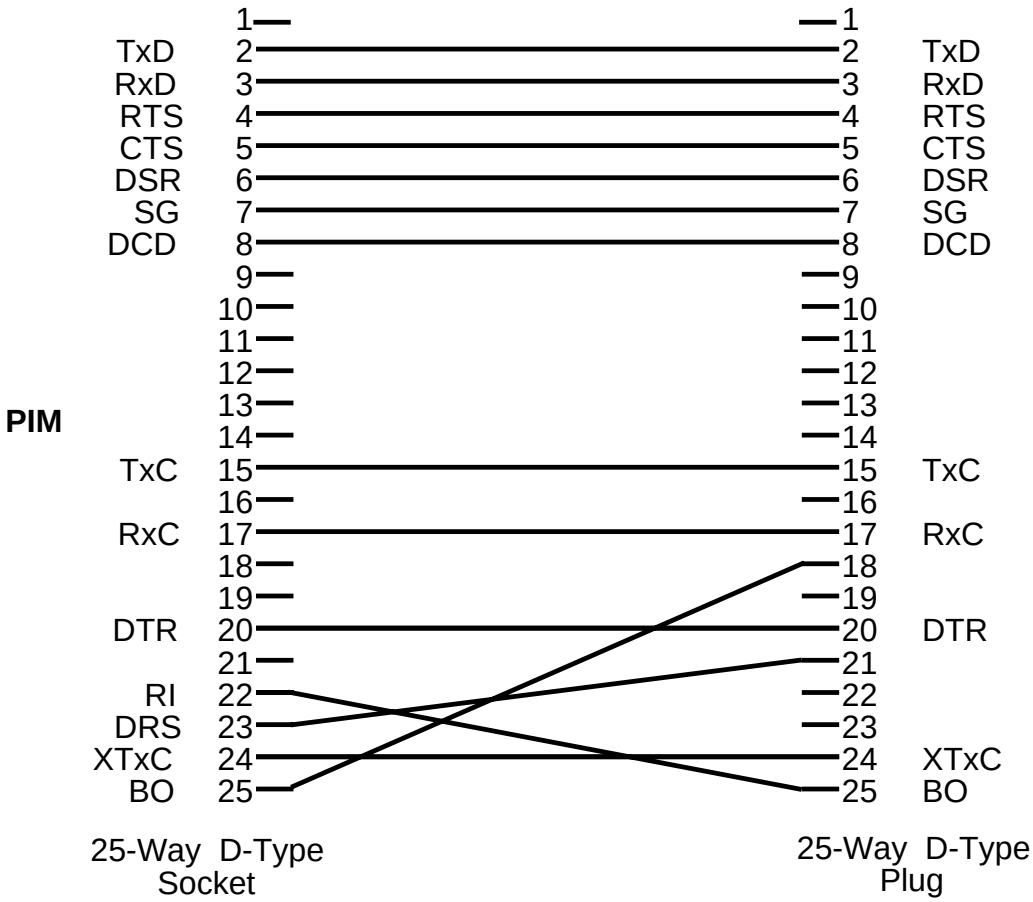

Figure C-3 V.54 DCE Cable X890-406311

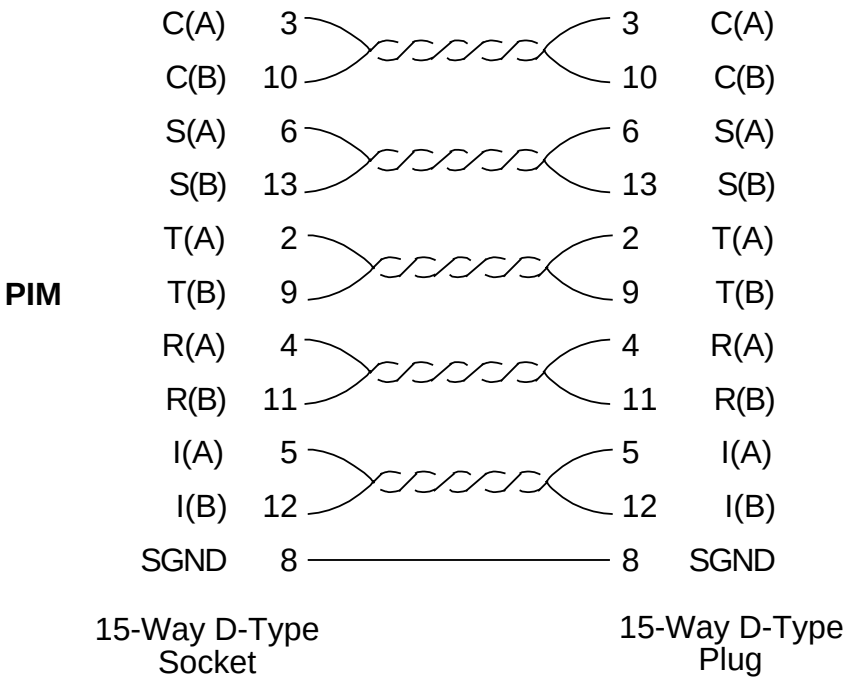

Figure C-4 X.21 Cables X890-401011 and X890-408811

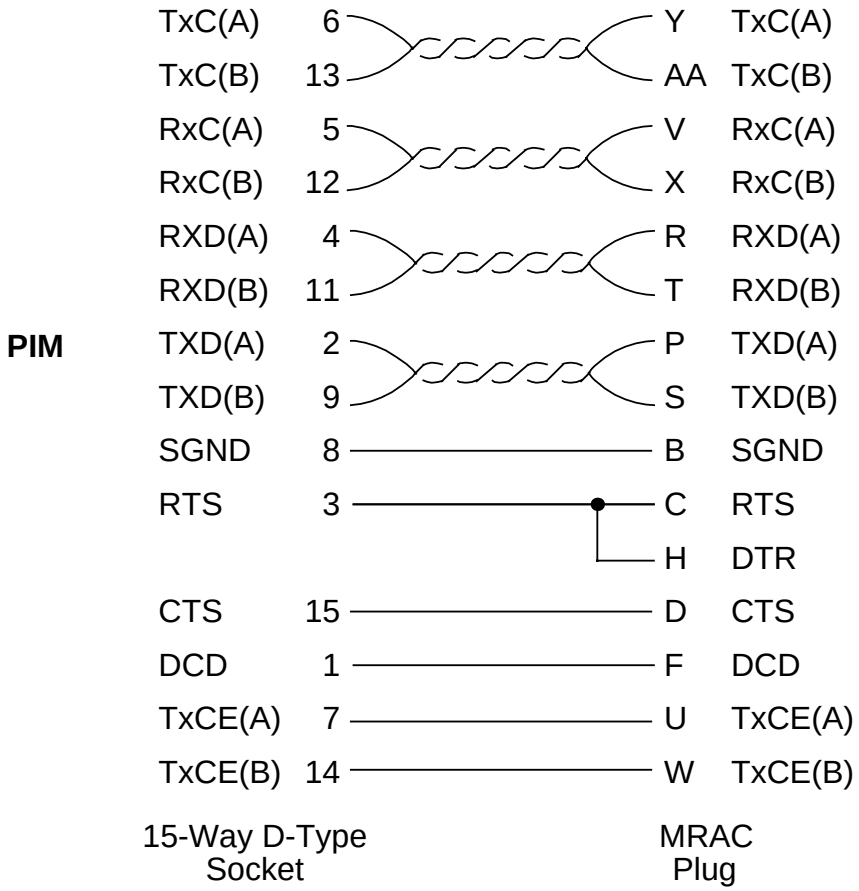

Figure C-5 V.35 DCE Cables X890-403411 and X890-409411

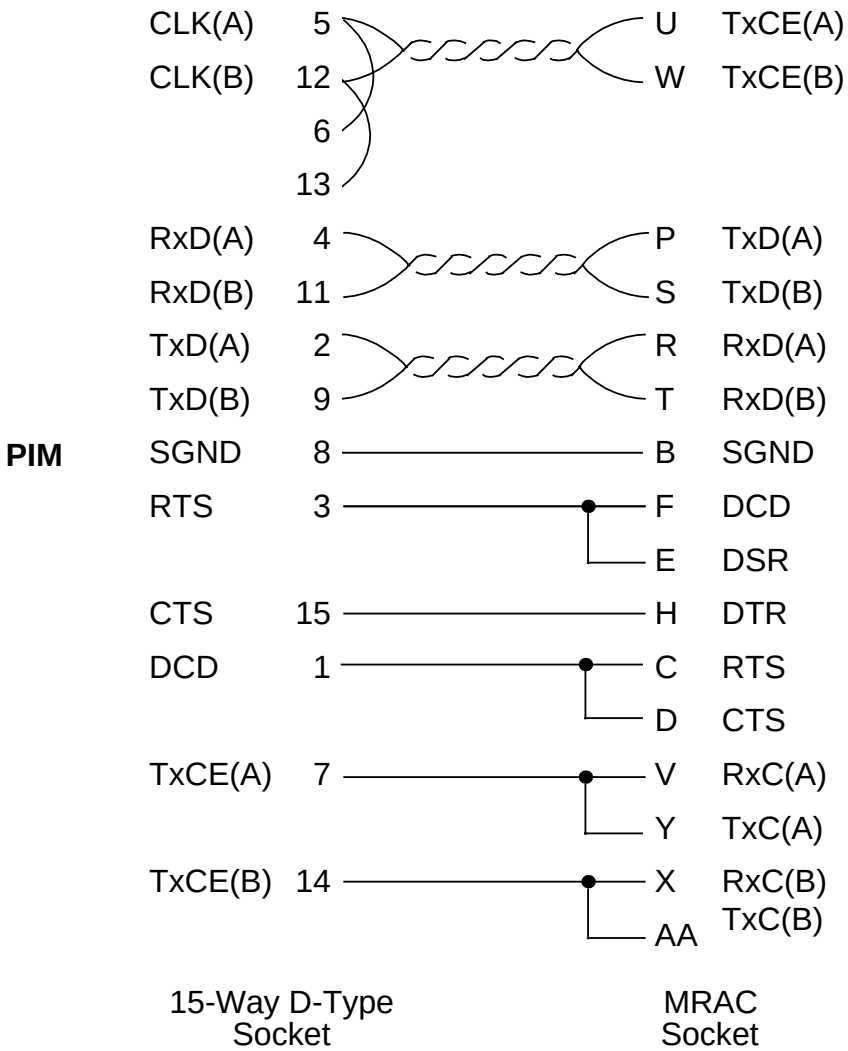

Figure C-6 V.35 DTE Cables X890-403311 and X890-409511

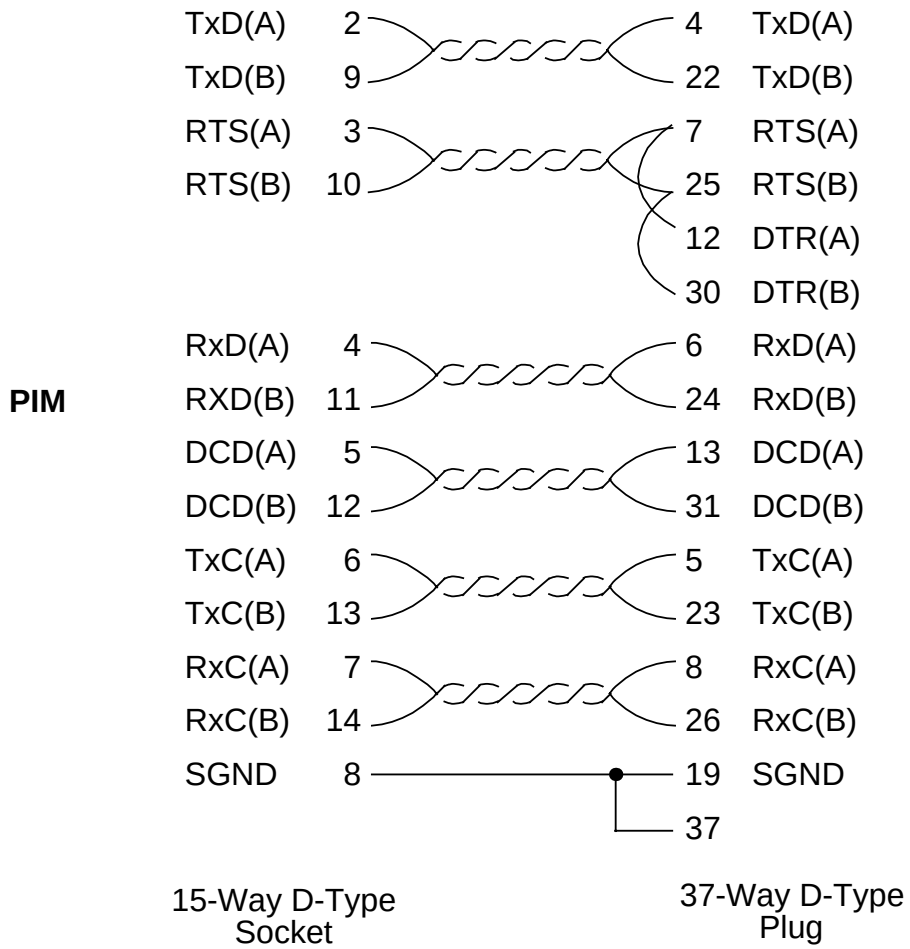

Figure C-7 V.36 DCE Cables X890-406611 and X890-409011

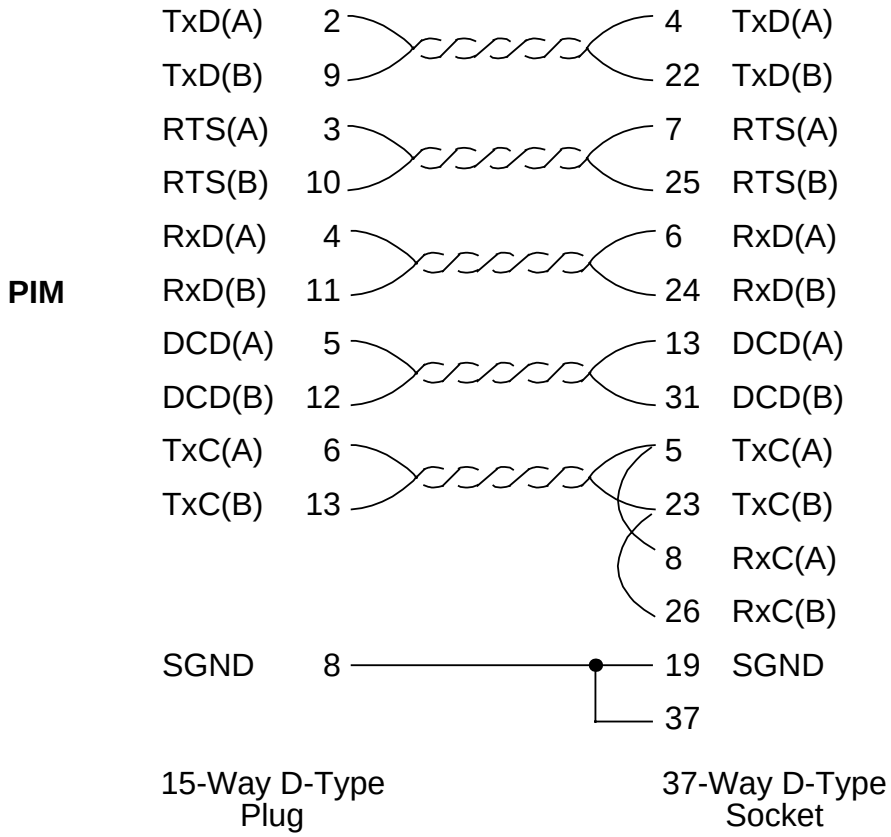

Figure C-8 V.36 DTE Cables X890-406711 and X890-409111

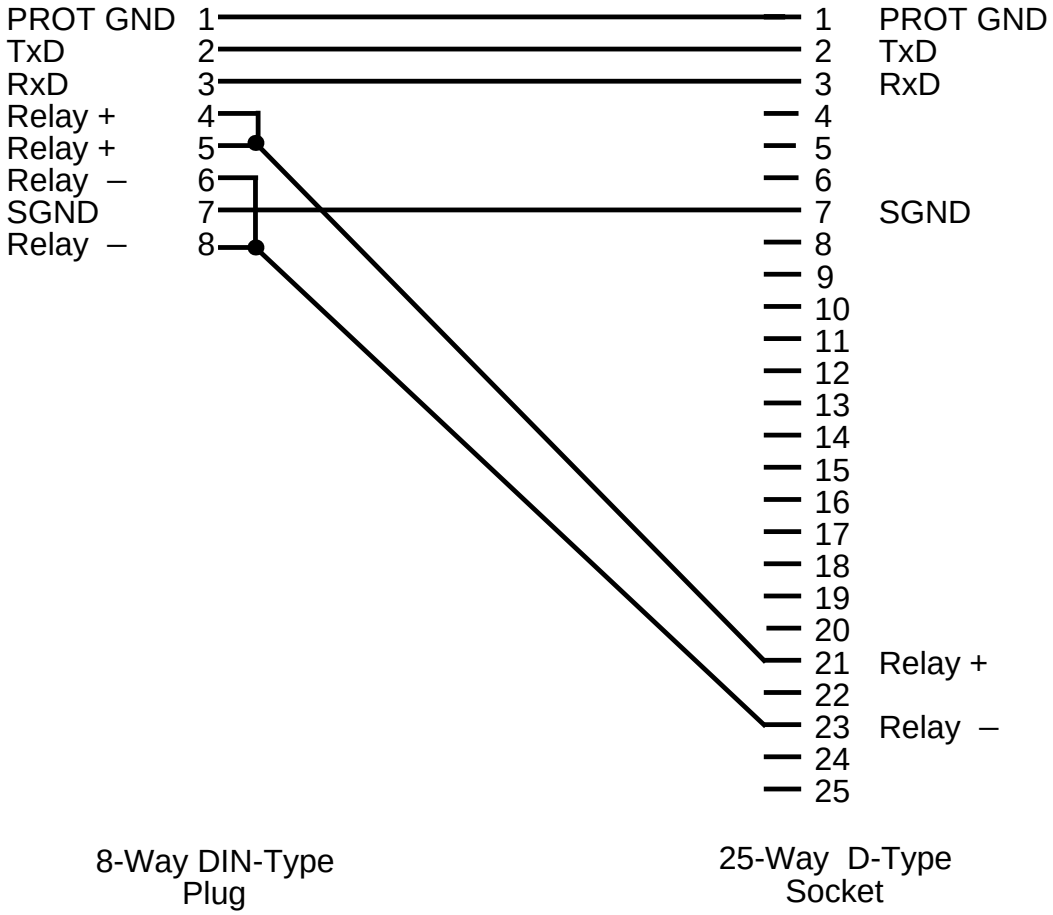

Figure C-9 V.24 to DIN 'Alarm & Diagnostic' Cable X870-401511

Appendix D UK PSS and KiloStream

D.1 General

Ports labelled "SAFETY WARNING See Instructions For Use" do not provide isolation sufficient to satisfy the requirements of the relevant parts of BS 6301. Apparatus connected to these ports must itself either be approved to the relevant parts of BS 6301 or have previously been evaluated against British Telecom (Post Office) Technical Guide 2 or 26 and been granted permission for attachment. **Other usage will invalidate any approval given to this apparatus**.

In order to meet the safety requirements of our PSS/KiloStream approval it is important to make sure that the equipment is correctly installed and maintained.

When delivered from the factory for use in the UK the physical interfaces of ports which can be connected to PSS and KiloStream are given in Table D-1. **Note that PIM4 and PIM5 ports are prohibited from connection.**

INTERFACE TYPE	PIM TYPE	LINE SPEED	CONNECTOR TYPE	CABLE PART NUMBER
V.24	1, 7	⩽ 19200 bps	2 × 25-way D-type male (DTE)	X818-401211
X.21	2, 6, 7	⩽ 64 kbps	2 × 15-way D-type male (DTE)	X890-408411
V.35	3	⩽ 64 kbps	2 × 15-way D-type male (DTE)	X818-401311
V.36	2, 6, 7	⩽ 64 kbps	15-way to 37-way D-type male (DTE)	X890-406611

Table D-1 Permissible UK PSS/KiloStream Connections

Connection to PSS and KiloStream NTUs must be made with the cables specified in Table D-1, and they must be installed by a competent engineer.

If **any** connections on a Super Card are connected to PSS or KiloStream then **all other** connections on that Super Card must be to apparatus that has either been approved to the relevant parts of BS 6301 or has previously been evaluated against British Telecom (Post Office) Technical Guide 2 or 26 and been granted permission for attachment. **Other usage will invalidate any approval given to this apparatus**. If there is any doubt as to the suitability of the equipment, then the advice of a competent engineer should be sought.

D.2 NET1 Considerations

The X.21 interfaces on Super Card **do not** provide 'DTE Uncontrolled NOT READY'.

V.24, X.21 and V.35 interfaces are approved for direct connection to digital networks using the cables specified in Table D-1.

The V.24 interfaces are for connection to PTO Service Category 1.

The V.35 interfaces are for connection to PTO Service Category 2.

The V.24 interface can only operate up to 9k6 bps for PSS connection, but up to 19k2 bps for KiloStream connection.

D.3 NTU Pin Assignments

Tables D-2 to D-4 show the V.24, X.21 and V.35 interface pin assignments presented to a PSS/KiloStream NTU at the NTU end of the cables specified in Table D-1. For the pinouts at the PIM end of the cables refer to Appendix B.

PIN NO.	DIRECTION	ASSIGNMENT
2	Output	Transmit Data (TxD)
3	Input	Receive Data (RxD)
4	Output	Request To Send (RTS)
5	Input	Clear To Send (CTS)
6	Input	Data Set Ready (DSR)
7	–	Signal Ground (SGND)
8	Input	Data Carrier Detect (DCD)
15	Input	Transmit Clock (TxC)
17	Input	Receive Clock (RxC)
20	Output	Data Terminal Ready (DTR)

Table D-2 V.24 Interface Pin Assignments (At NTU End of Cable X818-401211)

PIN NO.	DIRECTION	ASSIGNMENT
3	Output	Control (CA)
10	Output	Control (CB)
6	Input	Signal Element Timing (SA)
13	Input	Signal Element TIming (SB)
2	Output	Transmit Data (TA)
9	Output	Transmit Data (TB)
4	Input	Receive Data (RA)
11	Input	Receive Data (RB)
5	Input	Indication (IA)
12	Input	Indication (IB)
8	–	Signal Ground (G)

Table D-3 X.21 Interface Pin Assignments (At NTU End of Cable X890-408411)

PIN NO.	DIRECTION	ASSIGNMENT
Y	Input	Transmit Clock (TxCA)
AA	Input	Transmit Clock (TxCB)
V	Input	Receive Clock (RxCA)
X	Input	Receive Clock (RxCB)
R	Input	Receive Data (RxDA)
T	Input	Receive Data (RxDB)
P	Output	Transmit Data (TxDA)
S	Output	Transmit Data (TxDB)
B	–	Signal Ground
C/H	Output	Request To Send (RTS)
D	Input	Ready for Sending (RFS)
F	Input	Data Carrier Detect (DCD)

Table D-4 V.35 Interface Pin Assignments (At NTU End of Cable X818-401311)

PIN NO.	DIRECTION	ASSIGNMENT
4	Output	TxD (A)
22	Output	TxD (B)
7	Output	RTS (A)
25	Output	RTS (B)
12	Output	DTR (A)
30	Output	DTR (B)
6	Input	RxD (A)
24	Input	RxD (B)
13	Input	DCD (A)
31	Input	DCD (B)
5	Input	TxC (A)
23	Input	TxC (B)
8	Input	RxC (A)
26	Input	RxC (B)
19	–	SGND
37	–	SGND

Table D-5 V.36 Interface Pin Assignments (At NTU End of Cable X890-406611)

D.4 Cable Pinouts

Figures D-1 to D-3 give the pinouts of the three PSS/KiloStream cables listed in Table D-1.

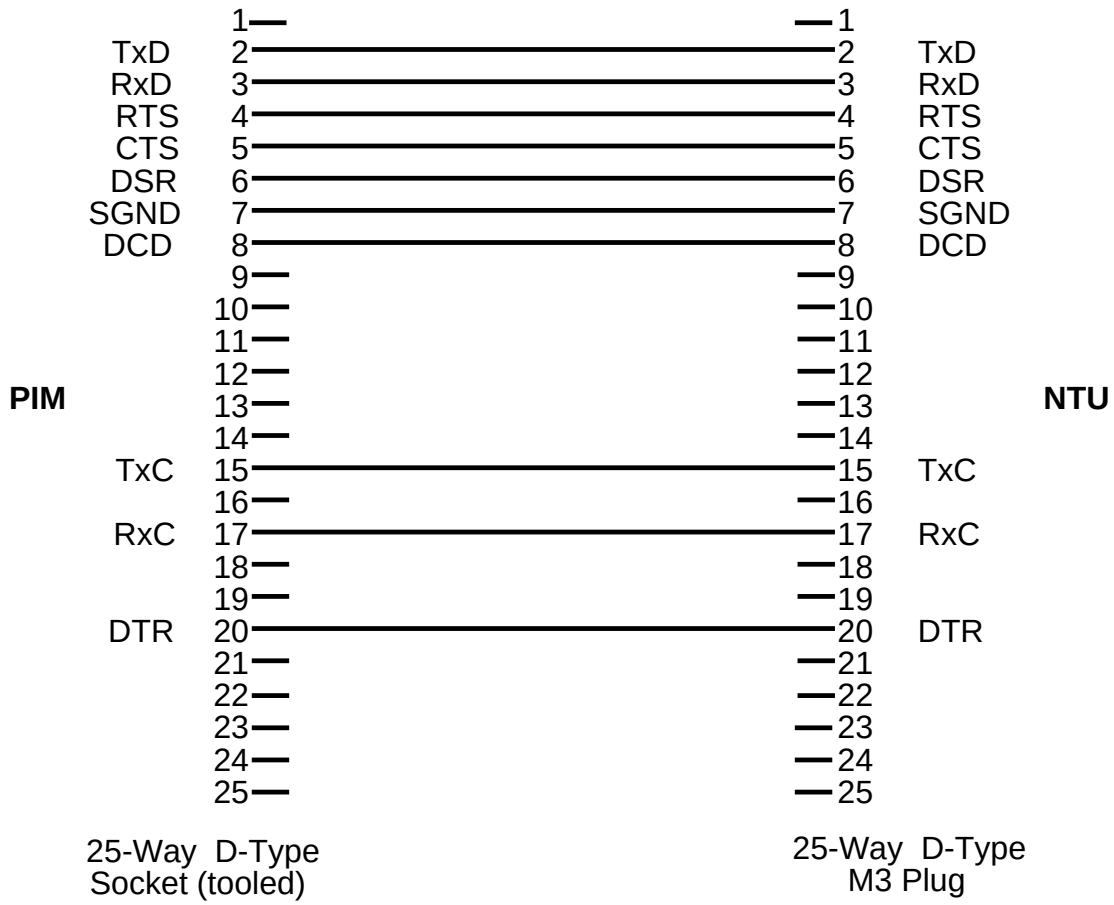

Figure D-1 V.24 PSS/KiloStream Cable Part Number X818-401211

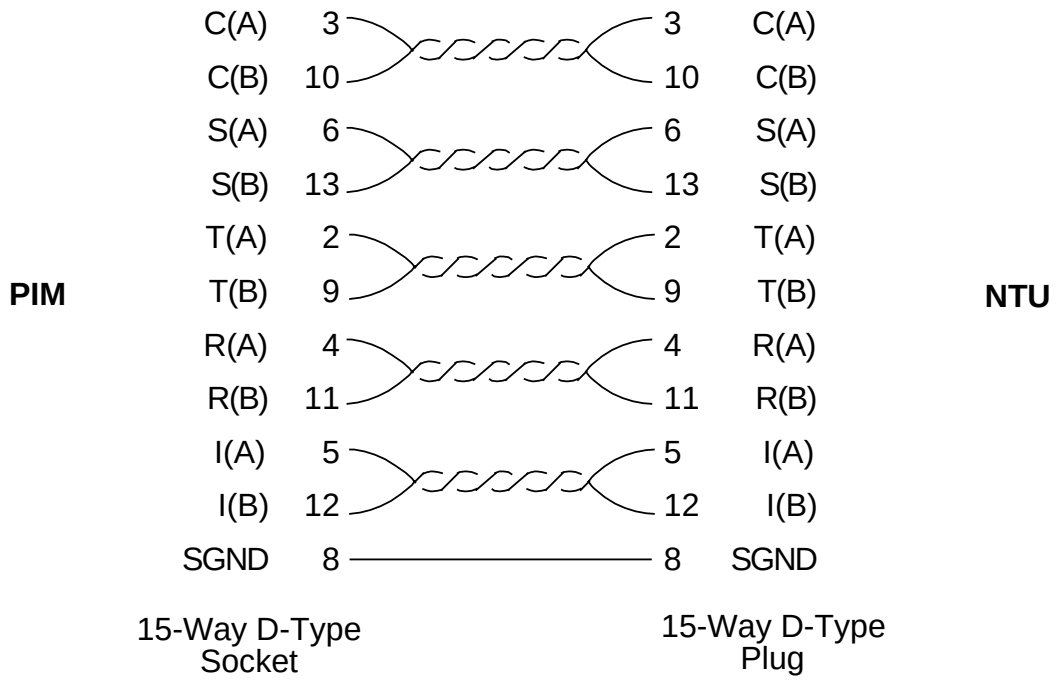

Figure D-2 X.21 PSS/KiloStream Cable Part Number X890-408411

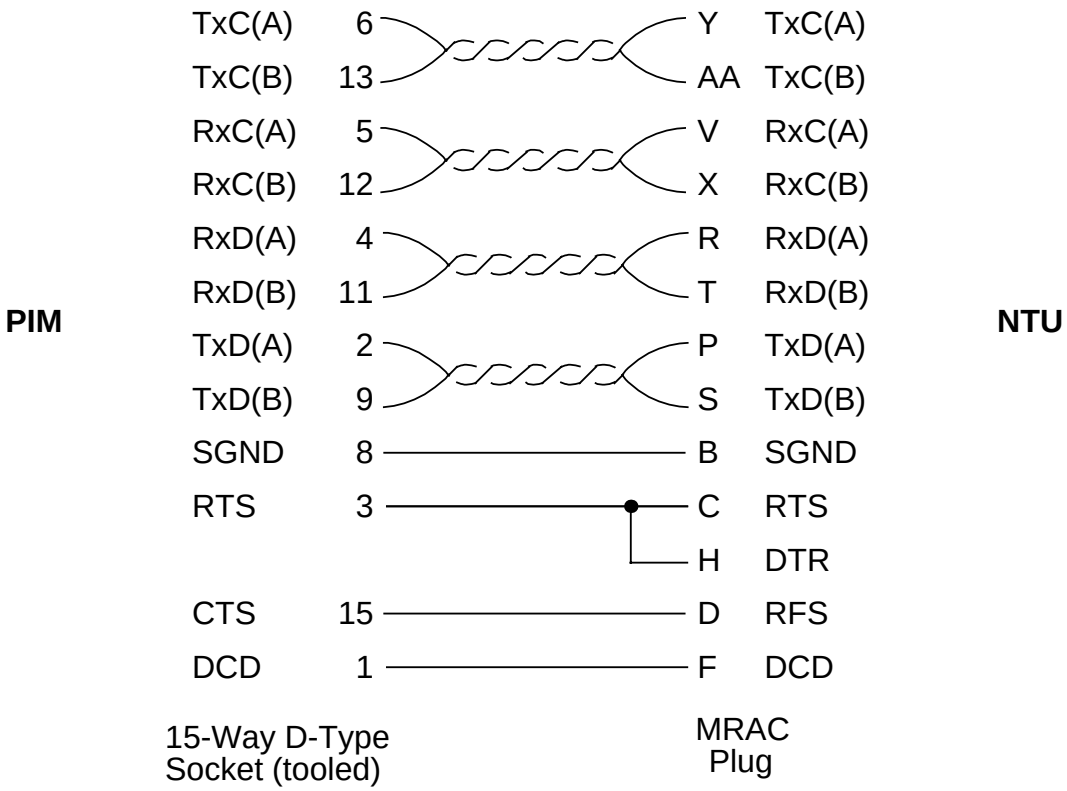

Figure D-3 V.35 PSS/KiloStream Cable Part Number X818-401311

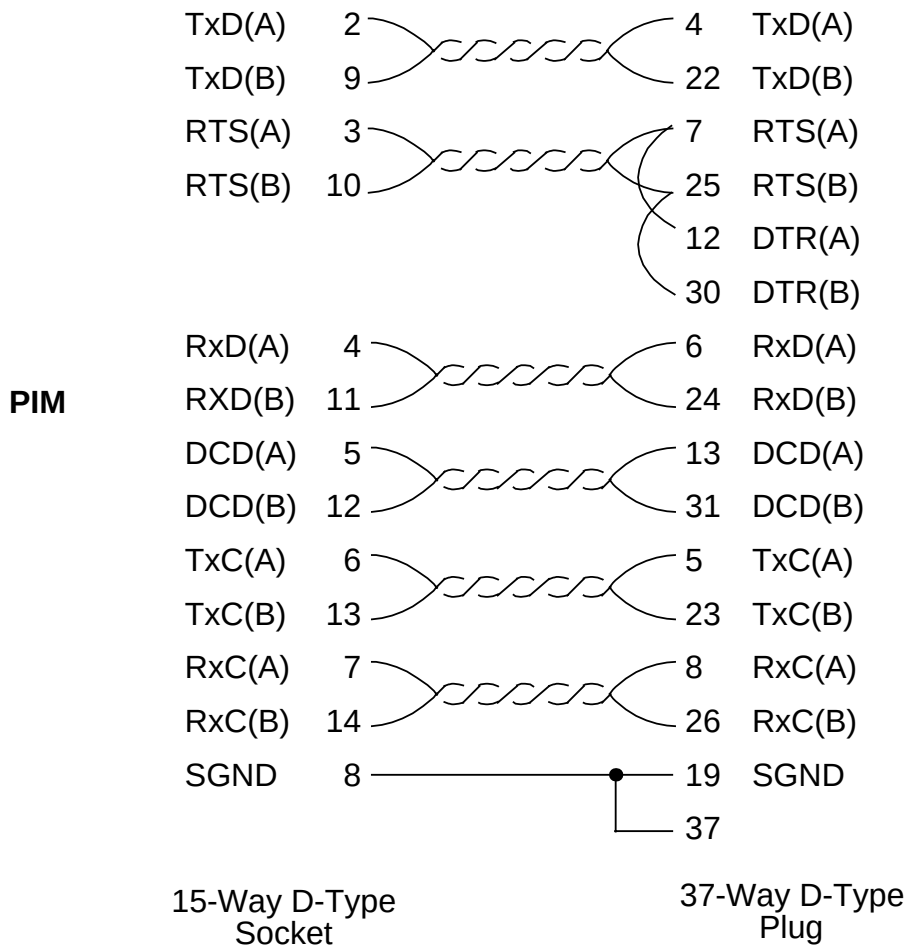

Figure D-4 V.36 PSS/KiloStream Cable Part Number X890-406611